

Bacon's

3481 New Tools Emerge For Navigating Internet's Labyrinth Of Databases

By Steve Higgins
Investor's Business Daily

Every day, 75,000 new documents appear on interconnected networks known as the Internet.

No source of information has ever been as comprehensive and up-to-date as the Internet. But even for the most proficient users, much of the network's valuable information is inaccessible.

✓ Computers & Automation

Information stored on thousands of Internet databases remains unused because users don't know how to get it.

"Stumbling through the Internet is a highly distasteful experience," said Mark Macgillivray, a Sunnyvale, Calif., consultant familiar with the Internet. "Unless I have to, I avoid the Internet like the plague."

While taking full advantage of the Internet still requires technical proficiency, the level of proficiency required is decreasing. Software companies are offering new programs designed to help computer users more easily find their way around the Internet's vast pools of data.

At the same time, other programs under development will let companies put their own databases on the Internet—with new security designed to keep that data secure from unauthorized users.

Together, the programs that point users toward important data and those that let corporations "post" their own databases on the Internet can potentially reduce the cost of business research and communications.

"There's an opportunity to make the Internet vastly more usable for business people. And that's what's going on now," said John Duhring, vice-president of WAIS Inc., a Menlo Park, Calif. software concern.

To the end-user, the most visible type of Internet software are the Internet graphical user interfaces.

Dialing Into Internet

Basically, Internet GUI's make it possible to dial into the network itself. Once the connection is made, the GUIs let users specify which Internet areas they want to search—whether its weather computers at the University of Michigan or the Medical College of Wisconsin's on-line bioethics service.

The most commonly used Internet GUI is Mosaic. Mosaic is still distributed free of charge by the University of Illinois, and commercial versions are under development by private companies such as The Santa Cruz Operation.

Another free Internet GUI, called Cello, was developed for and is available from the Cornell University Law School.

WinGopher, a Windows-based Internet GUI, is sold by Notis Systems Inc.

Behind the graphical user interface is the software that helps users navigate through the Internet. Navigation software is the most complex type of Internet software.

Two year-old WAIS is one company making such a

navigation program.

One way to think of the Internet is as an encyclopedia lacking a table of contents or index. WAIS is attempting to create an index after the fact.

WAIS, which stands for Wide Area Information Server, was originally developed by Thinking Machines Corp. In keeping with the historically non-commercial spirit of the Internet, the program was first distributed free of charge by Thinking Machines employees to colleagues in academia and corporate America.

But WAIS sells the program—and its expertise at installing it—to corporations and commercial on-line services who want to make their databases available to more users.

Acting As Translator

To the end-user, WAIS itself is invisible. It works as a translator between the Internet GUI and the Internet databases.

By incorporating machine intelligence, WAIS enables users to initiate relatively complicated searches with simple requests. For information on a particular topic, an end-user can query a database with WAIS in common English.

For example, to find information on weather patterns in California during April, a user might type "How often does it rain in April in California?"

WAIS will pick up on key words such as rain, California and April, and search for those words across a number of databases. Once found, a list of articles containing those words will appear on the computer screen.

If the user feels that WAIS is on the right track, a plain suggestion such as "Find more like that" will get retrievals of similar articles.

WAIS even has a language translator that lets users search databases in France or Germany, for example. Documents that match the query are translated by the machine and sent to the requestor.

A Japanese version of WAIS is currently under development by Fujitsu Ltd.

Other Programs Abound

To be sure, it's not possible to use WAIS for searches on all databases. WAIS only works on databases that have been set up for WAIS searches.

Other programs for navigating Internet databases include: World-Wide Web, available from Cornell; Gopher, available from the University of Minnesota; and Archie, available from the University of Ottawa.

Even as such free programs become increasingly used, Microsoft Corp. is planning to imbue forthcoming versions of its commercial software products with Internet access tools.

The next major upgrade to Windows, due at the end of the year, will have a built-in communications program capable of providing relatively easy access to Internet for inexperienced users.

Microsoft is also working on an E-mail product designed to make it easier for corporations to make data, such as annual reports and product lists, available on the Internet without creating a security risk.

able "bogies," the assembly attached to the bottom of a trailer that includes the wheels and axles. The configuration allows the trailer to run on the ground and on tracks.

in product, retooling costs would kill us," Ehrlich said. Without soft tools, "We wouldn't do these changes. We would let the tooling bin determine what we provide to our customers."

It buys only 100- to 200-mile feeder lines that dump into larger, more heavily traveled tracks. In comparison, the big railroads have 20,000- to 35,000-mile systems.

■ Does the line cultivate commodity diversity in terms of the freight it carries? No more than 20% of the company's total revenue can be wrapped up in one commodity.

RailTex with higher freight rates.

■ Is the line small? RailTex wants to avoid the labor problems that crop up on larger lines.

The company's formula has made it

NEW ISSUE PIPELINE

SOFTWARE LOGISTICS CORP.

An independent provider of software manufacturing services for makers of computers and peripherals and software publishers has filed for an initial public offering managed by Montgomery Securities and Kidder, Peabody & Co.

Software Logistics Corp.'s vertically integrated services include project management, software duplication, printing, assembly and order entry and fulfillment. The company manages the production process, from materials planning and procurement to shipment, for computer accessory kits, stand-alone software, peripherals and multimedia products.

Hardware makers and software publishers are turning to contract manufacturers to produce software and computer accessories. Reasons include shortening product life cycles and rapid technological obsolescence.

Contract manufacturing can shorten time to market, lower manufacturing costs and inventory levels, produce high quality and increase the ability to make frequent revisions to

products and production schedules.

Based in Fremont, Calif., Software Logistics, also known as Logistix Corp., is Apple Computer Inc.'s primary source of computer accessory kits for the domestic market. Apple accounted for 90% of the company's revenue in the fiscal year ended Jan. 31.

Revenue in fiscal 1994 was \$159 million, up 120% from fiscal 1993. Net income grew 78% to \$4.7 million, or 73 cents a share.

The company expects to sell two million shares at \$12 and \$14 each.

WOODS EQUIPMENT CO.

Accelerated new product development is expected to expand profit margins and market share for Woods Equipment Co., a maker of self-powered riding mowers and trailer-mounted grounds maintenance equipment, according to analysts.

The Oregon, Ill.-based company's decision to go public with an initial public offering of two million shares expected to be priced at \$9 to \$11

each was made to pay costs involved with broadening its product line.

Woods was created in 1993 to buy the Woods Division of Fiatallis North America Inc., a unit of Italy's Fiat SpA. Since then, Woods has put new management in place, made work force reductions and acquired a competitor, Du-Al Manufacturing Co. The Woods brand has existed since 1945.

Last year, pro forma net income was \$1.8 million or 44 cents a share, a 58% drop from fiscal 1993. Sales rose 16% to \$67.1 million.

First-quarter net was \$818,000 or 21 cents a share, against a year-earlier loss of \$763,000, 20 cents. Sales were up 72% to \$22.9 million.

After the offering, the company will have 5.8 million shares outstanding. The underwriting is being led by Dain Bosworth Inc. and Robert W. Baird & Co.

CINERGI PICTURES ENTERTAINMENT INC.

A movie production company is going public with three million shares expected to be priced

at \$12 to \$14 a share.

Cinergi Pictures Entertainment Inc., based in Santa Monica, Calif., was founded in 1989 by industry veteran Andrew Vajna, who has produced or co-produced 23 films. Vajna has produced films including "Medicine Man" and "Tombstone" for Cinergi.

Before he started Cinergi, Vajna's projects included "First Blood" and "Total Recall."

Cinergi hopes to produce and release two to four commercially successful films per year.

Last year, the company lost \$4.2 million, or 56 cents a share pro forma, down 57% from its 1992 deficit. Sales were \$9 million, down 77%.

But in the first quarter, the company earned \$2.3 million, or 30 cents a share pro forma, compared with a year-earlier loss of \$524,000, or seven cents.

Leading the underwriting are NatWest Securities Ltd., Seidler Cos. and Daniels & Associates.

KEYMARKET COMMUNICATIONS INC.

A company that owns 10 radio stations in midsize markets plans to go public with an initial offering of 4.15 million shares priced between \$11 and \$13 each. CS First Boston Group Inc. is leading the offering.

Keymarket Communications Inc. of Augusta, Ga., has agreed to acquire four FM and three AM stations in Buffalo, N.Y.; Nashville, Tenn.; and Los Angeles. The purchases should be completed before the offering.

The company's portfolio of 22 radio stations in six markets spans diverse geographic areas and programming formats ranging from country music to news talk shows.

Its strategy is to own two AM and two FM stations in the same market to maximize revenue and control costs.

Pro forma net income in 1993 was \$1.1 million, or 14 cents a share, adjusted for the pending acquisitions, a change in tax status and the planned public offering. Revenue rose 31% to \$24 million.



TECHNOLOGY & COMMUNICATION

By Steve Auerweck
Staff Writer

Revolution coming in data retrieval

A couplet for the Information Age:

"How do I search thee?
Let me count on WAIS."

Techniques for sharing information across data networks, nurtured in relative obscurity in computer labs and across the Internet, are bursting into bloom commercially.

Last week's Demo '94 computer conference in Palm Springs, Calif., saw two giant forces in the information business make parallel announcements of products that typify how data retrieval will be revolutionized in the next few years.

From Apple Computer Inc. came word that its AppleSearch system will break free of the constraints of local area networks to roam data bases across the world using the Internet. And Dow Jones & Co. said it will "publish" material from a variety of sources, including the *Wall Street Journal*, over the Net (see below).

Apple and Dow Jones were partners, along with the super-computer maker Thinking Machines Corp. and ICPMG Peat Marwick, in a research group formed several years ago known as the WAIS (pronounced "ways") Consortium: WAIS stands for Wide Area Information Server.

The group started with a standard called Z39.50 from the National Information Standards Organization in Bethesda, designed to specify how one computer should query another for material from a data base of text. From that core, aimed primarily at libraries, they refined details and wrote an initial program, which they distributed freely over the Internet.

Scores of researchers latched on to that material and developed it further for use at colleges and in government. Today, there are more than 400 WAIS "servers," or machines holding data bases, in more than 12 countries.

The idea beyond WAIS searching is that users should be able to enter important terms without worrying about the formal logic required in older systems. A server will present a likely list of documents, any of which can be used as a model for future searches.

It's a technique that appeared in AppleSearch with its introduction last September. The core software in AppleSearch was licensed from Personal Library Software in Rockville, which makes text-search packages for a number of platforms.

AppleSearch uses "Reporters," software tools that are set up to scurry around a network at regular intervals, gathering updates on topics that concern their masters. With the Internet version, scheduled to be released around the end of the year, those searches can be worldwide.

Apple spokesman John McCreadie pointed out that the result can be lower costs for those who pay higher rates for prime-time access to services.

While Mr. McCreadie was not willing to delve into Apple's long-

term strategy, he conceded that the company is evaluating the profit potential of other systems that have grown on the Internet.

Dow Jones boosts ways of using Internet

It was a coincidence that Dow Jones also chose the Demo '94 conference to announce its plans for selling financial news services through a variety of Internet tools, including WAIS.

Dow was in on the WAIS approach at the beginning, having decided in 1986 to offer a service based on free-form text queries. It decided then to use a radical idea, buying a Thinking Machines computer with thousands of processors working in parallel.

The resulting service, DowQuest, evolved into DowVision, through which the company distributes the text of the *Wall Street Journal*, the New York Times News Service, its own news services and press releases over leased lines to large business, which can then make the material available on internal networks.

Last week, Dow Jones said it will join with WAIS Inc., a company that was born from the original consortium, to distribute DowVision as a subscription-based service over the Internet.

Dow Jones spokeswoman Paula R. Dilco said the company hopes to start up the service by July or August. Pricing isn't known yet but will likely be based on a flat monthly fee.

The service will also be accessible through two other tools that have undergone meteoric growth in Net popularity in the past year.

One, Gopher, is a standard scheme for getting to documents by way of a tree-like arrangement of menus. The other, Mosaic, is a software package from the National Center for Supercomputing Applications in Illinois that organizes its documents as "hypertext," in which a term can serve as a pathway into a related document.

Earth Satellite gets SkyView workstation

Earth Satellite Corp. in Rockville has taken delivery of the first workstation in Unisys Corp.'s SkyView system, which will provide detailed weather data to customers ranging from forecasters to farmers.

Users on the new system are able to view weather information, such as radar data, lightning data, the National Weather Service's services and satellite imagery, all fed to the windowing terminals from a Unisys mainframe in Kennett Square, Pa.

At Earth Satellite, Lawrence J. Heltkemper, director of the Crop-Cast Division, anticipates using the new workstation to support weather products such as flash-flood and severe-storm forecasts.

In analyzing potential for floods, the division will integrate Landsat satellite data showing the vegetation, soil type and slope of a piece of land.

3481

The Wide-Area Information Server on the Internet is ready for its commercial debut, as a popular grassroots application comes of age

THE CASE FOR WAIS

By Charles Babcock

A new concept in client/server computing, the Wide-Area Information Server (WAIS), is coming of age on the Internet as a way to broadly disseminate information. It offers a promising model for the commercial world as well. These wide-area servers are providing access to databases of public or quasi-public information to any interested Internet user. There is a weather information server run by the University of Michigan, for example, and another that offers the lyrics of any popular song. So far, there are 434 WAIS-based databases out there.

THE FREWARE CONNECTION

To obtain WAIS client/server freeware, an Internet user can E-mail the following address: info@cnidr.org, which is the Clearinghouse for Networked Information Discovery and Retrieval in Research Triangle Park, N.C.

The software is also available by using the anonymous ftp (File Transfer Protocol) command to another Internet address: sunsite.unc.edu. Use the path of /pub/wais to get to the freeware directory. ■



◆ BREWSTER KAHLE says that while people await the information 'superhighway,' today's Internet has become the well-traveled 'dirt road'

"What people are looking for is the information superhighway. What we have is an information dirt road, but it's working," said Brewster Kahle, who created the Internet's first WAIS while working at Thinking Machines Corp. in Cambridge, Mass.

Some Internet users — including Kahle, who last year founded a private company, WAIS, Inc. in Menlo Park, Calif., to sell wide-area client/server software — are confident there is a commercial future for the wide-area network server. One scenario is that a new form of publishing business will be established to make vast quantities of information available at a fee through WAISs.

COMPANY BLUEPRINT "Access to reference information is extremely useful in the business world," noted Dan Goldman, spokesman for Perot Systems Corp. in Reston, Va., an early WAIS, Inc. customer.

WAIS provides a blueprint of how companies could make reams of standard, up-to-date information available to their employees. Lawrence Livermore National Laboratory in Livermore, Calif., is putting its management guidelines and health and safety rules onto a server that will be accessible to those who need it at the 8,000-employee facility, said David Grubb, a member of the lab's administrative information systems staff.

The Internet examples of WAIS are necessarily public information servers and open to any Internet user with the means to access them. But a business seeking to create its own WAISs has several options for keeping them closed to

employees or restricted to groups with the appropriate access privileges. Livermore Laboratory's in-house information, for example, will be placed on a server that is screened off the Internet by a router placed in front of it, Grubb explained.

Any business with a WAN can theoretically build databases and make them available on low-cost servers. WAIS also offers the opportunity for more direct information sharing between companies and their customers. Sun Microsystems Inc., for instance, has established a customer support database at the University of North Carolina. Customers can turn to that server for help before tapping more conventional forms of support, which in turn helps hold down costs for Sun.

Wide-area server capabilities came about through an early effort to automate library and other research text exchange over great distances using the Z39.50 protocol, which managed computer-to-computer links over a WAN. While at Thinking Machines, Kahle built the WAIS on top of the protocol to create a user-friendly approach to the wide-area server.

Mimicking the searches of large text management systems, Kahle created a search mechanism using key words typed in by the user. The search returns a list of documents to the user, with those scoring the most keyword hits listed at the top. By selecting those that are most pertinent, the user can direct the process through a feature built into WAIS called "relevance feedback." **CSJ**

Babcock is *Computerworld's* technical editor.

'OPEN' SECURITY:

Client/server design promises easy access to reams of critical information. Yet it also ushers in new ways for intruders to gain access and lose data. Here's how to cope.

By James Daly

It's enough to give the most stouthearted information security chief the willies. Thousands of PCs and workstations with dissimilar operating systems spread across an organization, connected to networks, minicomputers and mainframes in other locations, sometimes across states or countries.

It's also a reasonable description of a client/server environment.

The wide distribution and easy access to critical information, which has many users salivating over the prospect of establishing a client/server network, is already proving to be a nightmare to those trying to secure that data. Open networks mean new channels through which data can be lost and intruders can gain access.

"It's a whole new ballgame right now," said Brian Redler, director of security and operations at National Securities Clearing Corp., a financial service firm in New York.

Providing security in a widely distributed client/server design is different — far different — from the mainframe-centric, centralized security planning of the good old days. For one thing, many of the tools needed for the job are simply not there yet. "The approach right now is to cut and fit with what's available and, to tell you the truth, the fit isn't always that good," said Fritz Wagner, manager of corpo-

Daly is a *Computerworld* West Coast senior correspondent.

rate electronic information security at Du Pont Co. in Wilmington, Del.

Managing a mixed-platform client/server environment also means managing a lot of user confusion about things such as identifications, passwords, log-on sequences, data encryption and access privileges.

Yet information systems security chiefs need to get their hands around the issues — and fast. Some security experts say that protection of the electronic access to corporate resources may prove to be *the* most important issue in the next phase of client/server architecture development.

Consider the cost of letting down your guard. The Communications Fraud Control Association estimated that losses caused by unauthorized access to computer and telephone systems last year exceeded \$500 million in the U.S. and more than \$2 billion worldwide.

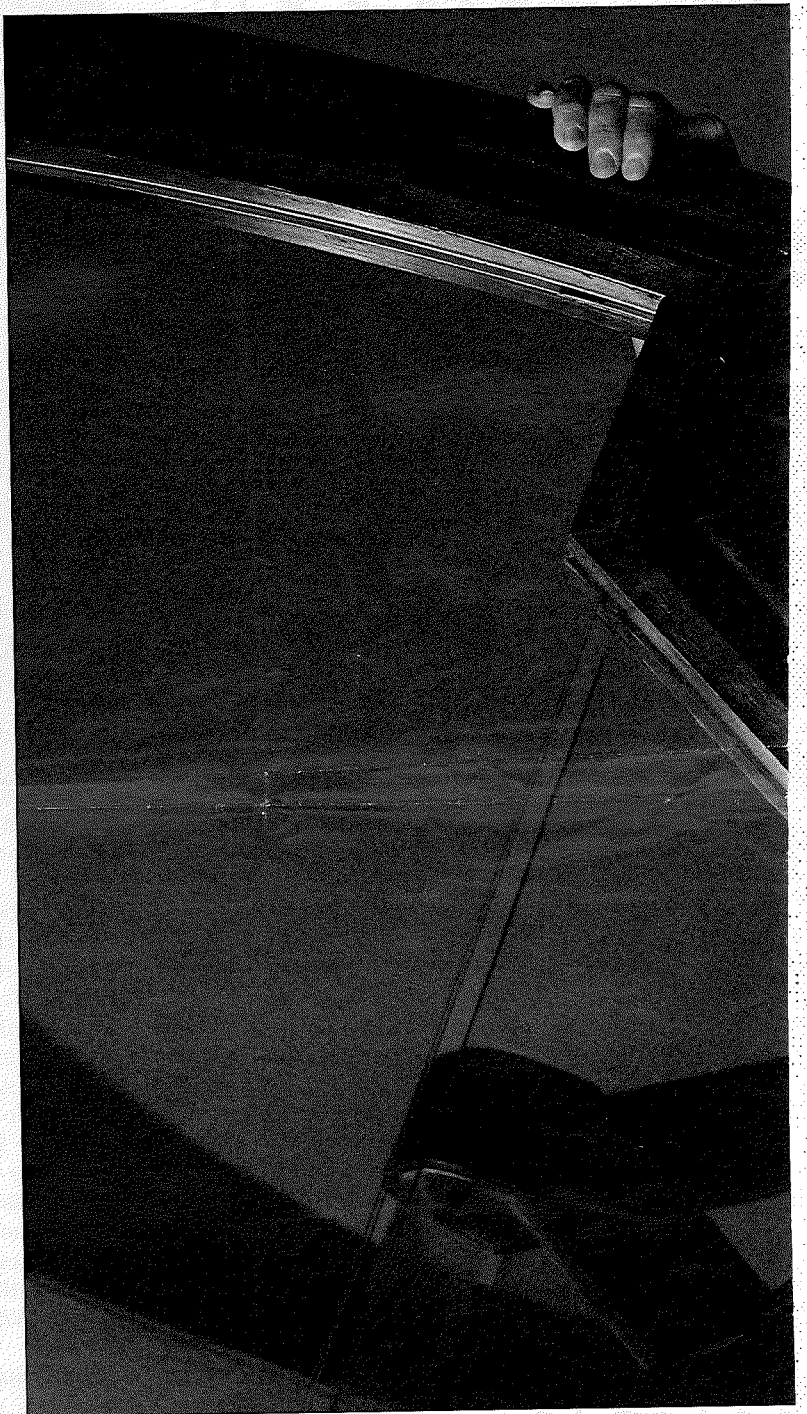
In another study by the University of Texas at Arlington, 43% of the companies that lose a major portion of their data via a major disaster (be it hacker or hurricane) will never reopen. And 90% will be out of business within two years.

"We're at the end of legacy systems and the beginning of broad distributed systems, so it's a critical time for people to plan for these things," said Bill Lowery, a manager at Toolmaker, Inc., a systems integrator in Bellevue, Wash.

Still, it won't be easy. Securing a client/server environment is like throwing mud at the invisible man — it may be messy, but pretty soon you get an outline of what you're up against.

RAISE AWARENESS Information security chiefs need to burrow into the client/server design process as soon as possible. "Computer security is still a difficult point to get across," said Jack Skalon, a network specialist at the University Hospital Consortium in Oak Brook, Ill. "People need to know security is not a joke."

Chief executive officers and top managers also need to play a more active role in planning data security, which some experts say is one place where early mistakes are made. "Sometimes I think that security administrators need to go to a Dale Carnegie course and learn



DU PONT'S FRITZ WAGNER says users must step up to the controls when it

SECURITY PRODUCTS

How do users rate their client/server products?

8% Poor
24% Fair
34% OK
18% Good
2% Excellent
14% Other/Don't know

What security tool would users most like to have?

58% Cross-platform security products
43% Single sign-on network-access devices
43% Telecommunications security packages
38% Virus protection packages
20% Data encryption devices

RESPONSE BASE: 219

RESPONSE BASE: 219
*MULTIPLE RESPONSES ALLOWED

3481 Electronic databases: Thinking aids of the future

By Lori Valigra

It was a sign of the times. Two students at MIT walking down the "Infinite Corridor," which links the Cambridge, Mass., school's maze-like campus, were overheard discussing their term papers.

"What are you covering in your paper?" one asked the other.

"I don't know. I'll have to do a keyword search of the databases and see what turns up," was the response.

While computer-generated term papers seem to defeat the purpose of the task — to think — electronic information databases are proving to be valuable aids for industry leaders and scientists. They are a quick way to become an expert on a competitor's finances, products or management without having to wade through stacks of magazines and newspapers. Trends can also be picked out of the records.

It all sounds simple, but is it? Until recently, most of the thousands

of databases available via computer networks have had their own syntax, basically requiring an expert to do a thorough search of several different databases.

Even sign-off syntax can vary, said Linda Martinez, assistant engineering librarian at MIT's Barker Engineering Library. Choosing the wrong one — "bye," "logoff," "logout," "exit" — can keep the access time clock ticking and add expense.

MIT, which is one of the more aggressive universities embracing database technology for its student engineers, is tackling the nomenclature problem by using one of the newer database products that allow common commands across many different databases.

MIT is testing FirstSearch, a collection of 29 databases containing article indexes or abstracts. It is a relatively new product from OCLC, a Dublin, Ohio-based nonprofit corporation that started as the Ohio College Library Center.

Cost considerations

Whether easy to use or not, full-text databases can quickly ring up high access charges. Rae Jean Wiggins, a librarian at MIT's Sloan School of Management, said one three-minute search on Nexis cost \$81 to download three files.

International Data Corp. expects unit shipments of full-text retrieval software to grow at a 29% annual rate through 1996, largely because of the popularity of CD-ROM.

FirstSearch is menu-driven. After logging onto the system via Internet, users are asked about their field of interest and are given several databases to check using a common set of commands.

The searches turn up a variety of results. For example, a sample search using the keywords "computer and Japan" found 276 references on the FirstSearch news abstracts database, including articles from *The Washington Post* and *The Wall Street Journal*. Using FactSearch turned up 31 references to publications such as *BusinessWeek* and the *Congressional Record*. A search for Disclosure, Inc., which has detailed financial information about companies traded publicly in the U.S., yielded 42 records.

But getting the listings, which can be printed from a PC, is only the beginning.

"After you find the information on the search, then you must find the library where it is located," Martinez said. There are a number of ways to do that. One involves going to WorldCat, the bibliographic database on FirstSearch, or dialing into library on-line catalogs.

Another is getting the full article

by accessing an independent full-text database such as Mead Data Central, Inc.'s Nexis or WAIS, the Wide Area Information Servers database located at Thinking Machines Corp. in Cambridge, Mass. Services such as Nexis, however, are expensive and carry strict usage guidelines.

WAIS, which is accessible through the Internet, can search 359 full-text databases. The downside is that its command line interface makes it difficult to use.

Though many of the databases are geared for use by large institutions, some are affordable for small firms, according to Joan Stapleton, a representative at Nelinet, Inc., a Newton, Mass.-based membership organization for New England libraries that brokers OCLC databases in New England.

FirstSearch for non-OCLC members costs \$100 per year, plus \$450 for each block of 500 searches. In addition, there is a dial-up access fee of \$8.40 per hour for those with CompuServe accounts, and a direct-dial charge of \$10.80 per hour on a WATS line.

Valigra is a free-lance writer based in Cambridge, Mass.

In the words of Josh Mailman, President of MVR, a major database consulting firm, "There's nothing to touch ReportSmith. I'll never use anything else."

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Gupta database server that housed the claims information and a few server.

Claims reconciliation of claims and

analysis services. That system uses a 486 server running The Santa Cruz Operation's SCO Unix and an Oracle Corp. database.

Users could bring up a claims image in one window while, in a second window, they could access the data needed to resolve that claim.

Praise from service providers

According to Wang's claims service providers, the use of Wang's imaging products is greatly facilitating the move from bankruptcy to reorganization.

"I cannot express to you the amount of paperwork involved in large bankruptcy cases — with 50,000 creditors, an average eight to 10 pages per creditor per claim and then three copies of each page," said Noel Bosco, an image representative at Poorman. "The advantage with the Wang system is the SQL-based database server, so that accessing large volumes of information is extremely quick and so is the creation of reports."

Claims services claims reconciliation software, which uses an Oracle RDBMS on Unix.

Results: Wang is expected this week to file its reorganization plan — on time.

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